which has this day been inaugurated. The first stone was laid in August, 1852, on the lawn belonging to the Royal Dublin Society's House, the situation of which will explain the somewhat incongruous shape of the entire structure, as shown in the ground plan. The following brief particulars will suffice to explain the situation of the edifice and its principal contents.

The main portion of the building forms nearly a square, presenting a frontage of 405 feet, and a depth of 425: this is divided into five large halls, the central one being a noble compartment of 425 feet in length, by 100 feet in breadth, and 104 feet in height. The great semicircular roof is supported by trellis ribs, constructed of timber, and rests on cast-iron columns, 45 feet in height; on either side are two compartments of 25 feet in width, running the whole length of the building; adjoining these are two Halls of 325 feet in length by 50 in width, with semicircular roofs 65 feet in height. These Halls are separated by compartments of 25 feet in width, on one side from the Machinery Court, a fine Hall of 450 feet in length by 50 in breadth; and on the other from the Fine Arts Hall, 325 by 40 feet. In addition to these, the Fore Court of the Dublin Society's House is surrounded by a large building 500 feet in length and 55 in breadth, being connected with the main building by a Court for Agricultural Machinery, 250 feet by 40 feet on one side; and on the other, by a Corridor leading into the Machinery Court.

THE TOWER CLOCK OF THE PALAIS DE JUSTICE AT PARIS.

Clocks entirely constructed by the laws of mechanics only date from the tenth century.

It is true that several historians relate that the celebrated Haroon-el-Rasheed, caliph of the Abassides, once sent Charlemagne some very valuable presents, among which was an inlaid brass and bronze time-piece, on which a great many allegorical figures were moved by wheel-work; but then this machine, which was very wonderful for the times, was nothing else but a clepsydra, or water-clock, its motive power being formed by falling water, which was renewed, at least, once a day.

It is also related that about the middle of the ninth century, Pacificus, Archbishop of Verona, made a magnificent time-piece, which marked, besides the hours, the day of the month, the days of the week, the rising and setting of the sun, the signs of the zodiac, &c. It is, however, very probable that this machine was moved like the one of the successor of the Prophet, by hydraulic force, thus being merely a clepsydra, and not a time-piece constructed by the laws of mechanics.

If we are to believe Haften, Moreri, Marlet, President Hénault, and *Les Annales Bénédictines*, Jerbert (Pope Sylvester II.) invented the first time-piece which went without the aid of water, by means of a compact mass of lead, brass, or iron, suspended by a cord to the first wheel of the works, and which, by communicating with a series of wheels working into each other, set the regulator, that is, the escapement, in motion.

In the eleventh century, no mechanism had, as yet, been invented to make time-pieces strike; it is, however, certain that the means by which to make them do so was known at the beginning of the twelfth century. The first mention made of clocks furnished with a striking-part is to be found in "Les Usages de l'ordre de Cîteaux," in which book, compiled about 1120, the sacristan is enjoined so to regulate the clock that it may strike and wake him up before the matins. In another passage of the same book, the monks are ordered to continue reading until the clock strikes.

At the beginning of the fourteenth century, clocks worthy of notice as monumental objects already existed in Germany, in Italy, and in many parts of France; but Paris, the capital of the kingdom, and where the fine arts, the sciences, and manufactures had made such progress, did not possess, in 1380, a single public clock. It is, however, right to mention, that a few sun-dials, rudely traced upon the walls, pointed out the hour to the passers-by; but then this could only be done when the sun was not hidden by atmospheric vapours. It is also true that hour-glasses and clepsydras of more or less costly manufacture were found in most houses; but these machines, which bore a strong resemblance to those used by the Romans in the time of Augustus, were incapable of measuring time with anything like precision. It is, in fact, very probable that when one of these machines marked twelve, another marked two o'clock, when it was really but ten in the morning.

In the fourteenth century, however, a few small clocks furnished with weights were seen in the mansions of the aristocracy; but they were nothing more than curiosities, for they did not mark the hour with any more precision than did the hour-glasses and clepsydras.

Charles the Fifth of France, who well deserved the appellation of the Wise, neglected nothing which might prove useful to the inhabitants of his good city of Paris, and he, therefore, bethought himself of having a clock constructed, and placed in the tower of his palace, so that the public might know the hour both day and night. But as there was no mechanician skilful enough in Paris to undertake such a work, the king sent to Germany for Henry de Wyck, a celebrated clock-maker, with whom he made an agreement for the construction and erection of the precious machine.

The German artist, say the Memoirs of the times, had apartments assigned him in the tower where the clock was to be placed, and he received six sous a day from the king for eight consecutive years—that being the time it took him to execute his work.

Jean Jouvence, a celebrated bell-founder, received the order to cast the bell against which the hammer of the clock was to strike the hours; and the clock itself, which, two centuries later, gave the signal for the St. Bartholomew massacre, was carried to the upper part of the tower, and fixed there in the most satisfactory manner.

It would be a great mistake to suppose that the wheel-work of the clocks of the fourteenth century was as complicated as the wheel-work of those of the latter part of the sixteenth century. Froissart, who was contemporary with Charles V., has left a very curious and very exact description of the clocks of his time, and, by the aid of this document, we shall now enter into a few details concerning the primitive construction of these machines.

The Amorous Clock is the title given by Froissart to his description, which is as follows:—

"Ou, vœil parler de l'etat de l'horloge
La premeraine roe (roue) qui y loge,
Celle est la mère et li commencemens
Qui fait mouvoir les autres mouvemens.
Le plonk (poids) trop bien à la beauté s'accorde.
Plaisance s'est moutrée par la corde,
Si proprement qu'on ne pourrait mieul y dire;
Car, tout ainsi que le contre-pois tire
La corde à lui et la corde tirée,
Quand la corde est bien à droit attirée,
Retire à lui et le fait émouvoir.

* * * * * * *

Après, affiert à parler dou dyal (mouvement diurne),
Et ce dyal est la roe journal,
Qui en surg jour naturel seulement,
Se moet (ment) et fait mi tour préciséments.
En ce dyal, dont grans est li mérites,
Sont les heures XXIIII d'écrites.
C'est le derrain (dernier) mouvement qui ordonne
La sonnerie, ainsi que elle sonne;
On faut savoir comment elle se fait,
Par deux roes ceste oeuvre se parfait.
Si porte o li (avec elle) ceste premeraire roe,
Ung contre-pois par quoi e se roe (elle se ment),
Et qui le fait le mouvoir, selong m'entente,
Lorsque levée est à point la destente,
Et la seconde est la roe chantore (roue de la sonneril)."

"But the clock's structure I soon will reveal:
The chief thing within is the principal wheel;
This is the spring and the mother of all,
And moveth the others, both large ones and small.
The weight with the nature of beauty agrees,
And pleasure's the cord which holds beauty with ease.
For what I assert I have full and just cause,
For in the same way that the well-balanced weight
Draws down the cord, as soon as 'tis drawn,
The first weight, again through the smooth even groove,
Once more pulls the cord back and makes the clock move.

* * * * * * *

At present, 'tis fitting I mention the face,
Which marks, without failing, old Father Time's trace.
The hands that go round in a certain fixed way,
Revolve only once in the space of a day;
And on this same face, which is worthy indeed,
The hours XXIIII you may easily read.
The last movement doth all the striking direct,
And makes the clock strike to a minute correct;
But if the whole process perchance you should ask,
I answer two wheels do effect the same task.
Within the first wheel does contain, you must learn,
A balance which causes it always to turn;
When raised fully up, then the hammer rebounds,
And straightway the second wheel loudly resounds."

In the above lines, Froissart describes the principal functions of the balance and the watchwheel. He says that clock-makers ought to raise the weights up often—that is, to wind up the clock.

It is evident from the description of the learned historian that the clocks of his time were composed of two sets of wheel-work very simply constructed. The first set, which moved the hands, only comprised three wheels; one to which the weights were suspended, one which communicated with the hour hands, and the ratchet wheel, whose teeth kept up the oscillatory motion of the balance.

The second set belonged to the striking part, the first wheel of which had a weight and fly suspended to it, and acted on a pinion fixed in the centre of another wheel, which drew the flier, that regulated the whole wheel-work of the striking part, along with it in its rotatory movement. The pins that served to lift the hammer, which was employed to strike the hour on the bell, were placed at the extremity of the diameter of the first wheel, and perpendicularly to its plane.

We have entered into these details, because we know that several learned men, and various clock-makers of all countries, have been mistaken in the descriptions they have given of clocks of the fourteenth century. And, to mention that of the Palais de Justice only, we may remark that it has been the subject of a somewhat grave error, committed by a man whose name is an authority in the scientific world. We mean the celebrated Julien le Roi.

This skilful artist saw the clock at the beginning of the eighteenth century, and supposing that it was still in its primitive state, he described it as he then saw it, and accompanied his description with explanatory figures. This description, however, is that of a clock of the seventeenth century, and not of the one which was constructed by the clock-maker of Charles V.

When Julien le Bel inspected the clock, three centuries had passed by since it had been first placed in the tower of the Palais de Justice; and he did not consider that, in the course of so long a time, it had been repaired, modified, enlarged, and improved, some ten or twenty times perhaps. Neither did he perceive, on examining this correctly-made piece of mechanism, that it could not be the production of an artist of the middle ages, when clock-making was still in its infancy, when no tools fitted to make the teeth of the wheels and pinions had been invented, and when the artist, after many an effort, only just succeeded in making the rickety works, which then composed a clock, turn gratingly upon their pivots.

Besides, the clock which he describes was not furnished with either weight or fly, of which one *ascends while the other descends;* it was wound up with a key like a modern clock. The dial-plate, too, was divided into twelve hours instead of twenty-four; while the striking part, the detent, the make of the wheels and pinions, the flier, and the parts that guided the hands, were all different in the clock described by Julien le Bel to what they were in the one made by Henry de Wyck. The balance is the only thing mentioned by him which was really contained in the latter machine; and this will be easily understood when it is remembered that the pendulum was only applied to clocks towards the middle of the reign of Louis XIV., and that all clock-makers did not immediately adopt this new kind of regulator, in spite of its incontestable superiority.

It is, therefore, evident that Julien le Roi was not acquainted with the construction of the first clocks, these machines being made, as can be proved on the best of authorities, in the manner described by the author of the "Amorous Clock."

We have but a few words to say with respect to the successive improvements made in the dial-plate of Henry de Wyck's clock. The most important ones took place under Charles IX. and Henri III. Charles IX. encircled it with frescoes and ornaments of the best possible taste. Germain Pilou executed two burnt clay figures, one of which represented Force leaning with one hand on a bundle of fasces, and holding in the other the tables of the law, while the other figure represented Justice, holding a balance in her left, and a sword in her right hand. The first figure was placed on the left, and the second on the right side of the clock.

Henri III. still further increased the splendour of these decorations, and Germain Pilou, who directed the works, finished them in 1585. The following is the description given of them by the historian Rabel:—

"Towards the end of the month of November, of the year 1585, the works of the dial-plate of the palace clock were finished. This clock, with its ornaments, is considered the handsomest throughout France. The director of the works was Germain Pilou, a master statuary, and one of the first in his art. He has executed such beautiful things in our city of Paris, and in other places in France, that his name will be for ever remembered.

"In the first place, there is, at the top of the dial-plate, the figure of a dove, intended to represent the Holy Ghost; beneath this, there is a crown of laurels, with two other crowns placed over the escutcheons of France and Poland; the whole of which is enriched with a collar of the order of the Holy Ghost, created and instituted by the present King Henri, while below is written:—

QUI DEDIT ANTE DUAS, TRIPLICEM DABIT ILLE CORONAM.

He who has already given two crowns will give a triple crown.

"On one side of the dial-plate, Piety is represented holding an open book, on which is written:

SACRA DEI CELEBRARE PIUS
REGALE TIME JUS.

O pious observer of divine law,
Respect royal right.

"And on the other is Justice holding a balance (the figures are called by Corroget, *Force and Justice*). Underneath the dial-plate is written:

MACHINA QUÆ BIS SEX TAM JUXTA DEVIDIT HORAS,
JUSTITIAM SERVARE MONET, LEGESQUE TUERI.

"These inscriptions were written by Jean Passerat, Royal Professor of Eloquence."

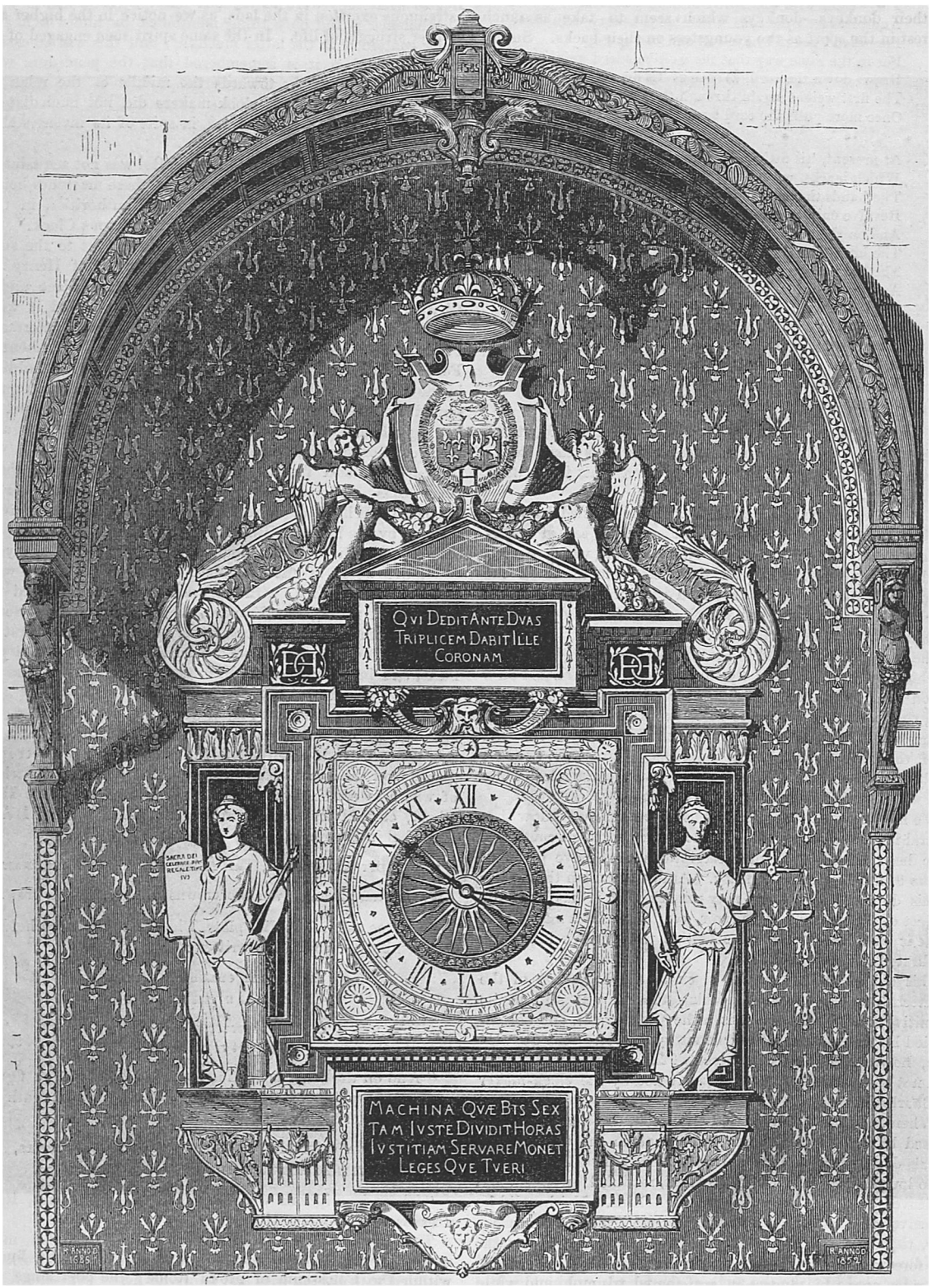
The last inscription is not quite complete. Rabel, moreover, does not tell us that the ground of the frame-work was studded with golden bees and fleurs-de-lis.

A hundred years later, Louis XIV. had the dial-plate of the clock again altered: but neither this prince nor his predecessors thought it necessary to mention, by an initial or inscription, that Charles V. had been the projector, and Henry de Wyck the constructor, of this monumental machine. Though the sovereigns who restore old monuments worthy of

being preserved merit our gratitude, yet those who have executed them merit it still more.

The clock which at present replaces that of Henry de Wyck was made by Monsieur Henri Leparete, and, judging from this gentleman's reputation, it is no doubt well constructed, and will not fail to keep good time.

The dial-plate is placed about twenty-three feet from the ground; and the diameter of the horary circle is four feet ten inches and a half. The bas-relief figures, which are placed on each side of the clock, are somewhat more than six feet high; while the general decorations occupy a space above twenty-four feet high, and above eighteen wide.



CLOCK OF THE PALAIS DE JUSTICE, PARIS.